

For 24 (1000) 31

6-1-1955-1959

SECTION IV

WOODEN PROJECTILE ~~POINTS~~ *Parts*

Pointed-base atlatl foreshaft:

Sample - 5.

Form: None of these are complete specimens, with the distal ends absent from all but one (from 67 of S15E10 of Tm c 248, which is one split in half but showing at least some part of both the distal and proximal portions). However, in spite of these deficiencies, I believe the form of this type may be reconstructed. All of them have cylindrical central portion of their bodies that have been ground smooth. The proximal one-third of the bodies have been tapered to a dull point or narrow flat end. Four of these ends are polished and the fifth was whittled. The proximal end has "long narrow V-shaped slot cut in it and their gum in the slot and adjacent parts of the body.

Dimensions: Length of split specimen - 137 mm.

Maximum diameters range from 11 to 14 mm.

Length of taper ranges from 14 to 43 mm.

Length of slot on split specimen - 26 mm.

Manufacturing technique: First a long (500 mm.) straight stick about 15 mm. in diameter was selected, the bark stripped off it or part of it. Next a point between the middle and one-third of its length was selected and sawed one-third of the way through from each of the opposite sides. Next two points on each opposite side parallel to the unsawed part, about an inch away, were selected. In two, these two opposite points a pointed or narrow wedge-like object was pushed cutting the exterior fibers of the wood and making a hole.

THE HISTORY OF

THE CITY OF BOSTON

FROM THE FIRST SETTLEMENT TO THE PRESENT TIME

BY

JOHN B. HENNING, Esq. of the City of Boston.
In two Volumes. VOL. I.
BOSTON: PUBLISHED BY J. B. HENNING, 1824.
NEW-YORK: J. B. HENNING, 1824.
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YONKERS: J. B. HENNING, 1824.

- 1. The first settlement of the city of Boston.
- 2. The growth of the city of Boston.
- 3. The decline of the city of Boston.
- 4. The revival of the city of Boston.

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Next, using the hole s as a hinge, the stick was bent toward one hole and then toward the other. Finally, cracks would form from the interior edge of the cut to the exterior edges of the holes. Further cutting of fibers in the holes and rockering would lead to the stick breaking in such a way that one broken end had a slot in it and the other had a short tang in it (that formerly fitted in the slot). Once this was done the slot pieces were kept for the atlatl foreshafts and the end opposite the slot tapered by whittling; then the whole surface was polished or abraded smooth.

Use: Once the foreshaft had been completed, a projectile point was set in gum inside the slot and string bound around the slot and, in some cases, part of the projectile point. This foreshaft with points was then set into a long piece of cane or mainshaft. These large mainshafts on the the two proximal ends with holes for a hook was probably projected by an atlatl.

Temporal Range: In southwest Tamaulipas this type lasts from 7,000 B.C. to 900 A.D. In Coahuila the type lasts up until historic times, while in the Great Basin similar foreshafts are 11,000 years old.

Geographical Range: This type occurs throughout the southwest, Coahuila, Big Bend area, Trans-Pecos, and the Great Basin.

Relationships:

References:

Blunted-base atlatl foreshaft:

Sample - 6.

Form: There are long, narrow cylindrical objects, pieces of wood with V-shaped notches in one end. Some of them have been grooved for string cut just below the notch and one has an incised geometric design all over it.

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Dimensions:

~~Diameter:~~ Maximum length ranges from 110 to 186 mm.

Maximum diameter ranges from 10 to 15 mm.

Maximum length of notch ranges from 11 to 26 mm.

Manufacturing technique: Same as with the Pointed atlatl foreshafts except the proximal ends were not tapered.

Use: Same as Pointed-base atlatl foreshafts.

Temporal and Geographical Range: Canyon Infiernillo, 400 to 7000 B.C.

Relationships: These are undoubtedly related and possibly derived from the pointed base type. This shift in style may in part be due to the fact that the Tamaulipas peoples were using cane mainshafts, not hollowed-out wood ones, so a tapered point was not necessary.

References:

Atlatl dart bunt:

Sample - 1.

Form: This is a small barrel-shaped artifact with a small basal tang.

Dimensions: Maximum length - 40 mm.

Maximum diameter - 16 mm.

Length of tang - 5 mm.

Manufacturing technique: This was made by taking a thick stick, skinning the bark from it, and then encircling it with two whittled rings about 3²10 mm. apart. Then the small section was snapped into at the cut rings, the distal ground to a flat end, and a whittled point cut on the other end.

Use: The gum on and around the stem suggest this tang was set inside some sort of a hollow shaft and the size of the bunt suggests that it was a dart shaft. Thus the object was an atlatl dart bunt, perhaps used for killing small game or birds.

1. Introduction

The purpose of this study is to investigate the effects of

the proposed system on the performance of the

system in terms of accuracy and speed.

The study is organized as follows: Section 2 describes the

proposed system architecture.

Section 3 presents the experimental setup.

Section 4 discusses the results of the experiments.

Section 5 concludes the study and outlines future work.

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Temporal and Geographical Range: The one specimen from southwest Tamaulipas falls
is
in the period from 1,400 to 1,800 B.C. This/somewhat earlier than they
appear in the Trans-Pecos, southwest, or Great Basin area.

Relationships:

References:

Unilateral barbed atlatl foreshaft:

Sample - 1.

Form: This was made from a piece of wood rectangular in cross-section. The tip
is abrupt. One edge is straight while the other has ten squarish barbs in
it which are slightly less thick than the main part of the shaft. The
proximal part of the shaft (which disintegrated before it was photographed)
was more or less cylindrical and the base was flat.

Dimensions: Length - 211 mm.

Thickness - 8 mm.

Width - 12 mm.

Barb height - 2 mm.

Barb length - 14 mm.

Barb thickness - 1 mm.

21
Manufacturing technique: Grain of the wood that it was made from a small straight
stick. Next it was ground so that it had a rectangular cross-section, a
large narrow tapering point and a more or less cylindrical-based section.
Then one of the narrower sides was cut lengthwise twice so that two long,
rectangular sections about 1/3 the width were removed. This left a narrow
ridge. Next, a series of oblique V-shaped cuts were made in this narrow
ridge so that barbs were formed.

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Use: The shape of the base plus its diameter indicate the barbed point was set in a foreshaft or in an atlatl dart.

Geographical and Temporal Range: Canyon Infiernillo - 1400 to 1800 B.C.

Relationships: ?

References:

Possible atlatl foreshaft fragments:

Sample - 12.

Form: These are a series of heterogeneous sticks which I believe may have been atlatl foreshafts. Five are split sticks that have a smooth polished surface and both ends broken. Because of their smooth surfaces and average diameter of about 12 mm., I believe they were atlatl foreshafts. More convincing are three similar sticks with gum on one of their ends and two with part of the notches apparent. Another split fragment with gum seems to be part of the distal end of a foreshaft next to the slot. The final piece is the least convincing as it is a cylindrical polished stick with both ends broken off. Just which type of atlatl foreshaft these were is most difficult to determine and eight of them I would not venture to guess about. However, four (three from an Ocampo layer and one from Palmillas) might possibly be Blunt-base foreshafts.

Dimensions: Diameter about 12 mm.

Temporal and Geographical Range: 6000 B.C. to 1750 A.D.

Atlatl foreshaft blanks:

Sample - 3.

Form: These are long sticks with square tangs on one end.

Dimensions: Maximum length ranges from 58 to 239 mm.

Maximum diameter ranges from 8 to 11 mm.

Maximum length of tangues - 11 to 13 mm.

Maximum thickness of tange - 2 to 5 mm.

and the other of the same kind, but the latter is not so large as the former.

A specimen of the same kind is also found.

The following are the names of the specimens found in the same locality.

1. *Amphipoda*

2. *Amphipoda*

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18. *Amphipoda*

19. *Amphipoda*

20. *Amphipoda*

21. *Amphipoda*

22. *Amphipoda*

23. *Amphipoda*

24. *Amphipoda*

25. *Amphipoda*

Manufacturing technique: Explained under description of Pointed-base atlatl foreshafts.

Use:

Relationships:

References:

lance shaft:

Sample - 1.

Form: Stuck to one large Tortugas Triangular point is a fragment of cane. It has been slotted at one end and the point with gum as an adhesive sets in the slot.

Dimensions: Diameter - 17 mm.

Manufacturing technique: A long piece of cane was sawed into _____ and then one of the sawed ends slotted by sawing downward against the main axis of the shaft.

Use: The main reasons for believing this to be a lance foreshaft are its large diameter, the heavy weight of its point, and the fact that the fragment (128 mm.) shows no evidence of being cut, nor is there any wear inside the cane indicating that a sort of mainshaft had been inserted into it.

Geographical and Temporal Range: 2400 to 4000 B.C. in Infiernillo Canyon, Tamaulipas.

Use:

Relationships:

References:

1. The first part of the report is devoted to a general survey of the situation in the country.

2. The second part is devoted to a detailed study of the various branches of the economy.

3. The third part is devoted to a study of the social and cultural life of the country.

4. The fourth part is devoted to a study of the political situation in the country.

5. The fifth part is devoted to a study of the foreign relations of the country.

6. The sixth part is devoted to a study of the future prospects of the country.

7. The seventh part is devoted to a study of the various problems which arise in the course of the development of the country.

8. The eighth part is devoted to a study of the various measures which are necessary for the solution of these problems.

9. The ninth part is devoted to a study of the various measures which are necessary for the improvement of the living conditions of the population.

10. The tenth part is devoted to a study of the various measures which are necessary for the improvement of the cultural life of the population.

11. The eleventh part is devoted to a study of the various measures which are necessary for the improvement of the political situation in the country.

12. The twelfth part is devoted to a study of the various measures which are necessary for the improvement of the foreign relations of the country.

13. The thirteenth part is devoted to a study of the various measures which are necessary for the improvement of the future prospects of the country.

14. The fourteenth part is devoted to a study of the various measures which are necessary for the improvement of the various problems which arise in the course of the development of the country.

15. The fifteenth part is devoted to a study of the various measures which are necessary for the improvement of the various measures which are necessary for the solution of these problems.

16. The sixteenth part is devoted to a study of the various measures which are necessary for the improvement of the living conditions of the population.

17. The seventeenth part is devoted to a study of the various measures which are necessary for the improvement of the cultural life of the population.

18. The eighteenth part is devoted to a study of the various measures which are necessary for the improvement of the political situation in the country.

19. The nineteenth part is devoted to a study of the various measures which are necessary for the improvement of the foreign relations of the country.

20. The twentieth part is devoted to a study of the various measures which are necessary for the improvement of the future prospects of the country.

21. The twenty-first part is devoted to a study of the various measures which are necessary for the improvement of the various problems which arise in the course of the development of the country.

Distal end of dart mainshaft:

Sample: 2.

Form and

manufacturing technique: Both of these pieces are of cane of fairly large

diameter, which have one end broken and the other neatly cut. On the inside of the cane adjacent to the cut end there is evidence of wear while on the outside both have some blackening due to gum. One has a piece of cord adhering to the gum which was obviously once wrapped around the shaft.

Dimensions: Exterior diameters range from 15 to 19 mm.

Interior diameters range from 13 to 17 mm.

Use: These are distal ends of dart mainshafts which were re-enforced by wrapping of string, and into which were inserted foreshafts. Their exterior diameter is close to that of proximal ends of atlatl mainshafts and their worn interior diameters are close to that of the dart foreshafts so I believe they were propelled by spear-throwers.

Temporal and Geographical Range: Canyon Infiernillo, 1400 to 1800 B.C.

Proximal end of dart mainshaft:

Sample: 2.

Form and

manufacturing technique: These are pieces of cane cut at one end and broken at the other. The cut has gum on it and there are impressions of cords in the gum going around the shaft next to the end. Of particular note is the basal interior sections, for both of them show a small area of about 3 mm. wide and extending into the cane for a distance of from 3 to 5 mm.

Dimensions: Maximum diameter: 12 and 19 mm.

Use: The worn areas on the interior suggest that an atlatl hook had rubbed on them while the exterior string suggests some sort of re-enforcement that would keep the force of the thrust ~~back~~ hook from splitting the shaft.

Temporal and Geographical Range: Canyon Infiernillo - 1800 to 400 B.C.

Relationships:

References:

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Possible dart mainshafts:

Sample: 25.

There are twenty-five fragments of of more than 12 mm. in diameter. Seventeen of them have gum on them. These might be atlatl dart mainshafts.

Possible atlatl:

Sample: 1, or possibly 2.

Form: These are two pieces of wood very different in form and there is an extremely good chance that neither are atlatls. One from Occupation 4 of Tm c 247 is a small flattish piece of wood broken on its two ends. Both surfaces are polished smooth. One surface is convex while the other is almost convex but has a shallow, 1 mm. deep, groove about 5 mm. wide in its middle. The stick is about 32 mm. long from one broken end to the other, about 22 mm. wide at one end and 26 mm. wide at the other. Its maximum thickness is about 7 mm. There is a remote possibility that this is the central section of a flaring-ended atlatl and that the groove is part of the channel leading to the spur. It is not illustrated because it could not be found when a photographer was available. The other possible atlatl was classified with worked sticks for a considerable length of time. It is a long (252 mm.) cylindrical (18 mm. in diameter) with the bark stripped off and one small section of a branch (10 mm. long and 3 mm. in diameter) near one end. Quite by accident, water washed off the section of the stick near the branch and evidence of work was apparent. This work consisted of whittling flat the portion on the longer section leading to the branch. Furthermore the base of the branch has been cut on three sides next to the whittling so it makes a slight catch. It may be possible that this stick was to be whittled flat on two surfaces and the branch or knot formed by the branch used as spur for an atlatl.

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Pointed-base arrow foreshaft fragments:

Sample: 18.

Form: Most of these (9) are pointed sticks, round in cross-section, with pitch on them. Five of these have a definite ring of pitch about 60 mm. from their tips. Five others are smaller pointed fragments broken off inside cane mainshafts. These are considered proximal ends of arrow foreshafts. Another is in a more doubtful category and it is the earliest one in the sequence from Occupation 8, Tm c 247, a Guerra level. This one is long (292 mm.) and tapered like the others with gum near its tip, but is oblong in cross-section (maximum diameter 12 by 7 mm.) and has a groove down one flat side. Whether it was part of an arrow foreshaft or not is difficult to determine. All the above have their distal ends broken off. Two others from San Lorenzo appear to be distal arrow foreshafts with their proximal pointed tips broken. Both have V-shaped notches in one end with pitch [?] around them and have cylindrical bodies extending to within about 10 mm. of their broken ends where some [?] painting with pitch occurs. One was found sticking in the ribs of burial 3 in Tm c 247 and had a Matamoros Triangular point near it. The final one is complete. It has a tapered pointed base about a fifth of its length, covered with pitch and ending in a ring of pitch. Then there is a long cylindrical body ending in a blunted [?] and polished proximal end with a little pitch on it. There is some evidence of an original notch in this end that has been removed by polishing. ^{or wear}

Dimensions: Estimated maximum length ranges from 245 to 496 mm.

Estimated maximum diameter ranges from 7 to 11 mm.

Length of tapering ranges from 70 to 130 mm.

Length of basal pitch ranges from 40 to 105 mm.

Depth of distal notch ranges from 3 to 5 mm.

1941-1942

1941-1942

There was a time when the political situation was very different.

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Manufacturing technique: These are made from straight sticks. First they were sawed and broken to the desired length. Then the bark removed and their surface smoothed or abraded. Next one end was either tapered by whittling and then smoothed or merely tapered by abrading. Finally a V-shaped notch was cut in their distal ends. The foreshaft was thus completed, to make it usable, an arrow point was set in gum in the distal end and bound to the stick and proximal end covered with gum and jammed into a cane foreshaft with sufficient force to [?]bind ^{push} the gum up into a ring.

Use: Arrow foreshaft.

Geographical and Temporal Range: In southwest Tamaulipas all but one possible foreshaft appear in the period from 300 to 1750 A.D. with a marked increase over the atlatl after 900 A.D. In the Trans-Pecos Southwest and Great Basin they begin a little earlier, circa the time of Christ, and become dominant in the Anasazi before 700 A.D., in the Mollogon from 700 to 900 A.D. and in the Big Bend area about 900 A.D. Thus there seems to be a steady slow southward spread from the Great Basin to Tamaulipas. Further indication of a slow southward spread are the (bone) arrow foreshafts in Old Bering Sea (0-500 B.C.) in ^{Alaska} and the possibility that they were present in Cape Denbigh ^{Siberia} from 2000 to 4000 B.C. in the New World Arctic. Also, they appear to be present by at least 3000 B.C. in Northeast Siberia.

Relationships:

References:

Possible arrow foreshafts:

Sample: 7.

These are small fragments of cylindrical sticks with polished or smoothed exteriors and their two ends broken. Two have possible gum on them. They are all between 6 and 11 mm. in diameter, like the ^{more complete arrow}atlatl foreshafts, and appear in the same horizons, so I am assuming they are arrow foreshaft fragments.

Distal end of arrow mainshafts:

Sample: 5.

← Form: and manufacturing technique: All of these are pieces of cane broken at one end. The opposite ^{ends} are neatly cut off (sawed?), smeared with gum and show evidence of winding or reinforcing. The three latest ones have thin strands of fiber wound around them, the earliest one has impressions in the gum of fine cord, while the other ^{have} two fine cotton (?) string wrapped around them. All have broken pieces of wooden foreshafts inside them. Four of them are tapered wooden sticks, while the other has two small sticks about 4 mm. in diameter, slightly flattened on the side toward each other that served as foreshaft.

Dimensions: Maximum length unknown but more than 293 mm.

Maximum diameter ranges from 5 to 11 mm., averaging 7 mm.

Maximum length of gum ^{ranges from} 40 to 120 mm.

Maximum length of winding of string ranges from 4 mm. (3 winds) to 22 mm. (178 winds).

Use: Arrow mainshaft.

Temporal and Geographical Range:

References:

Relationships:

References:

Proximal end of arrow foreshafts:

Sample: 4.

Form and manufacturing technique:

All of these are made from cane and ^{is based on} two of the specimens are very small split pieces showing a portion of U-shaped neck so much of what will be described are the larger specimens. The distal end of back is broken but the other ends have been cut (sawed?) just below a joint and a U-shaped neck cut in them. A short distance from the base gum starts and

1. The first of these is the

2. second

3. third

4. fourth

5. fifth

6. sixth

7. seventh

8. eighth

9. ninth

10. tenth

11. eleventh

12. twelfth

13. thirteenth

14. fourteenth

15. fifteenth

16. sixteenth

17. seventeenth

18. eighteenth

extends for from 120 to 130 mm. from the base. On both both there are length-wise areas on two sides or three sides without gum, where I believe feathers had been attached. One shaft in each of these three gum-less areas has eleven short (4 mm.) lines extending in a column up the shaft. The illustration shows only the part that survived in storage.

Dimensions: Maximum length range more than 310 and 321 mm.

Maximum diameter ranges from 9 to 12 mm.

Maximum depth range - 1.5 mm.

Maximum width range - 4 mm.

Temporal and Geographical Range:

Relationships:

References:

Possible cane mainshaft fragments:

Sample: 33.

^{These are}
The ~~one~~ piece of cane ^{between} ~~been~~ 5 and 12 mm. in diameter (of the same size of distal and proximal ^{arrow} mainshaft ends) that are broken on both ends. Five have gum on them. With one exception they appear in the period from 300 to 1750 A.D. the same as other arrow fragments.

Bow tip fragments:

Sample: 3.

Form and manufacturing

technique: These are small pointed objects convex on one side and flat on the other. The surfaces ^{has} ~~have~~ been smoothed as has the point. The other end has been broken off but just above the break a V-shaped groove has been cut into the convex edge. The bottom of the groove, particularly at the junction of convex and flat surface, is worn.

Dimensions: Maximum length of tip ranges from 22 to 38 mm.

Maximum width of tip ranges from 10 to 14 mm.

Maximum thickness of tip ranges from 7 to 9 mm.

Maximum width of groove ~~on tip~~ ranges from 4 to 9 mm.

Maximum depth of groove ranges from 2 to 4 mm.

Use: I believe these were bow tips because of their plano-convex cross-sections and the fact that near their pointed tips they have grooves worn in the manner that a bow string wears a groove.

Temporal and Geographical Range:

Relationships:

References:

Arrow bunts:

Sample: 2.

Form: Both of ~~Both of~~ these are slightly different. One is a small short barrel-shaped piece with a basal spur with gum on it at one end and a blunted other end. The other is a long narrow cylindrical stick with a rounded end and gum near its broken proximal end.

Dimensions: Maximum length ranges	141 mm.	31 mm.
Spur length	6 mm.	12 mm.
Spur diameter		6 mm.

CHAPTER I

SECTION I

ARTICLE I

DEFINITION

THE EARTH IS A SPHERE, AND ITS SURFACE IS CURVED.

THE EARTH IS DIVIDED INTO TWO PARTS, THE NORTH AND THE SOUTH.

THE NORTH PART IS CALLED THE NORTH POLE, AND THE SOUTH PART IS CALLED THE SOUTH POLE.

THE EARTH IS SURROUNDED BY A THIN LAYER OF AIR, CALLED THE ATMOSPHERE.

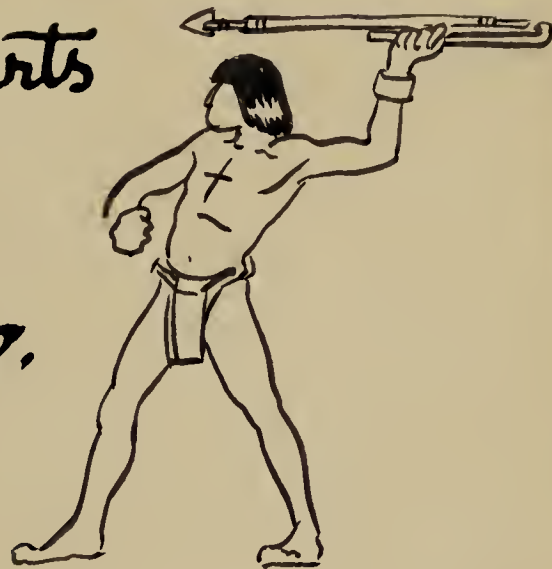
THE ATMOSPHERE IS DIVIDED INTO FOUR PARTS, THE CLOUDS, THE RAIN, THE WIND, AND THE LIGHTNING.

THE CLOUDS ARE MADE OF WATER, AND THE RAIN IS MADE OF WATER.

THE WIND IS MADE OF AIR, AND THE LIGHTNING IS MADE OF FIRE.



Ancient Mexican Darts
About 5000 years old
From Cave near Ocampo,
Mexico.





Dr. Woodbury.

The
Cathedral

2000

SECTION 12.

WOODEN

TRUSS

PKTS

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